

PROFESSIONAL ACTIVITIES:

Publications and Speeches are listed in separate sections.

Referee for *Antitrust Bulletin* (1988 and 1992), *Applied Economics* (1983, 1984 and 1989), *Contemporary Policy Issues* (1991), *Managerial and Decision Economics* (1989), *Social Science Quarterly* (1987).

Invited Participant. U.S. Information Agency, American Participant Program in Argentina and Brazil, 1990.

Invited Discussant, Western Economic Association Annual Meeting, Economic Research at the FTC, 1986.

Invited Discussant, Illinois Institute of Technology, Center for the Study of Ethics in the Professions, Conference on Intellectual Property, 1985.

Invited Participant, Institute of Health Economics and Social Studies, Seminar on the Pharmaceutical Industry, 1978.

Awarded Summer Research Grant, University of Pittsburgh, Faculty of Arts and Sciences, 1978.

Invited Participant, Chicago Board of Trade, Summer Intern Program, 1977.

Received Commendation for Excellence in Teaching, University of Iowa, 1976.

Awarded Teaching and Research Assistantships, University of Minnesota and University of Iowa, 1969-1972 and 1973-1976, respectively.

Awarded HEW Scholarship, College of St. Thomas, 1965-1969.

Member, American Economic Association, Beta Gamma Sigma (National Honor Society in Business and Management), Delta Epsilon Sigma (National Scholastic Honor Society), Omicron Delta Epsilon (International Honor Society in Economics).

PUBLICATIONS:

"A Critique of the GAO Report on Differences in Prices for Prescription Drugs Between Canada and the United States," *Journal of Research in Pharmaceutical Economics*, forthcoming in summer of 1994.

"The Consequences of Pharmaceutical Product Patenting: A Critique," *World Competition*, Volume 16, March 1993, pp. 91-106.

"Parallel Trade in Pharmaceuticals: The Impact on Welfare and Innovation," (with R. Rapp), *Journal of Economic Integration*, Volume 7, Autumn 1992, pp. 181-203.

"Bidding Theory and the Baseball Player Market," *Kentucky Journal of Economics and Business*, Volume 11, September 1991, pp. 15-28.

"Discounted Cash Flow Analysis in Patent Infringement Litigation," (with C. Salisbury), *Licensing Economics Review*, Volume 1, August 1991, pp. 7-10.

"Toward a Definition of Effective Competition in Energy Markets," *The Electricity Journal*, Volume 4, July 1991, pp. 28-37

"Benefits and Costs of Intellectual Property Protection in Developing Countries," (with R. Rapp), *Journal of World Trade*, Volume 24, October 1990, pp. 75-102. Reprinted as "How Property Protection Fuels Economies," *les Nouvelles*, Volume 27, September 1992, pp. 156-170.

"The Importance of Flexibility in Competitive Resource Procurement," (with L. Nordgulen), *The Electricity Journal*, Volume 3, June 1990, pp. 48-59.

"Competitive Bidding in Electricity Markets: A Survey," *The Energy Journal*, Volume 10, October 1989, pp. 117-138.

"Summary of 'Price Discrimination and Patent Policy' by J. Hausman and J. MacKie-Mason," *Manual on the Economics of Antitrust Law*, American Bar Association, Sixth Supplement, Summer 1989, pp. 11.1-11.2

"Technology Transfer: Licensing's Crucial Role," *Economic Impact*, Number 66, March 1989, pp. 50-54.

"Protection of Intellectual Property Through Licensing: Efficiency Considerations," *Journal of World Trade*, Volume 22, October 1988, pp. 27-34.

"Differences in Service Mix Between For Profit and Nonprofit Hospitals," *New York Economic Review*, Volume 18, Fall 1988, pp. 43-56.

"Bibliometric Analysis of U.S. Pharmaceutical Industry Research Performance," (with F. Narin), *Research Policy*, Volume 17, June 1988, pp. 139-154.

"A Nonparametric Test for Economies of Scope," *Applied Economics*, Volume 20, May 1988, pp. 653-663.

"Intellectual Property and Economic Growth," *Economic Impact*, Number 62, March 1988, pp. 43-47. Reprinted in *Viewpoint*, Volume 18, Summer 1989, pp. 23-29.

"A Bidding Process for a Centralized Market With Trading Out of Equilibrium," (with S. Wu), *Journal of Economics/Zeitschrift fur Nationalokonomie*, Volume 47, October 1987, pp. 287-307

"Diversification by Nonprofit Firms: Competitive Implications," *Kentucky Journal of Economics and Business*, Volume 7, 1986-87, pp. 33-42.

"Protection of Intellectual Property Rights: Research and Development Decisions and Economic Growth," *Contemporary Policy Issues*, Volume 5, July 1987, pp. 54-65. Reprinted in *Intellectual Property (Patents, Copyrights, Trademarks) Policy and International Negotiations* (B.S. Dameron, editor), Washington: International Law Institute, 1987; and *Intellectual Property Rights in Science, Technology, and Economic Performance: International Comparisons* (F.W. Rushing and C.G. Brown, editors), Boulder: Westview Press, 1990

"On the Behavior of For Profit and Nonprofit Hospitals," *Proceedings of the Inaugural Meeting of the Pennsylvania Economic Association*, Volume 1, May 1986, pp. 200-212.

"Competition as a Complement to Regulation," *The Energy Journal*, Volume 6, July 1985, pp. 79-90.

"The Over-Capitalization Effect with Diversification and Cross Subsidization," *Economics Letters*, Volume 16, October 1984, pp. 159-163.

"The Role of Market Power Measures in the Search for an Antitrust Case," *The American Economist*, Volume 28, Fall 1984, pp. 36-40.

"Rate of Return Regulation and Vertical Integration Under Uncertainty," *Mathematical Modelling*, Volume 4, July 1983, pp. 87-96.

"Brand Identification and Advertising: The Case of a Generic Trademark," *Applied Economics*, Volume 14, June 1982, pp. 235-248.

"A Model of the Firm's Demand for Money Under Uncertainty," (with S. Wu), *Metroeconomica*, Volume 31, June 1979, pp. 225-241.

"The Effects of Imperfect Information on Market Equilibrium," *Papers and Proceedings: Southwestern Society of Economists*, Volume 4, March 1979, pp. 235-240.

"The Formation of a Trader's Reservation Price," *Atlantic Economic Journal*, Volume 6, July 1978, p. 92.

"Numerical Examples of a Market Adjustment Mechanism," (with G. Moulton), *Modeling and Simulation*, Volume 8, December 1977, pp. 1027-1031.

THESES:

"A Non-Tatonnement Bidding Process for a Centralized Market," unpublished Ph.D. thesis, University of Iowa, 1976.

"Topologies on Function Spaces." unpublished M.A. thesis, University of Minnesota, 1971.

SPEECHES:

"Meeting the Future Challenges of Health Care Reform," speech before the Institute for International Research Conference on Patient Information, Education and Compliance Programs, 1993.

"Setting The Economic Scene for the Next Seven Years: Health Care," speech before the Annual Meeting of the Actuarial Society of Greater New York, 1993.

"Parallel Trade in Pharmaceuticals: The Impact on Welfare and Innovation," speech before the Southern Economic Association Annual Meeting, 1992.

"The Use of Bidding and Auctioning Models in Competition Analyses," speech before the NERA Twelfth Annual Antitrust & Trade Regulation Seminar, 1991.

"Benefits and Costs of Intellectual Property Protection in Developing Countries," a series of speeches before academic, business and government groups in Argentina and Brazil, 1990; lecture to graduate students in the International Management Program at the University of Maryland, 1990; and presentation at a seminar sponsored by the Minister of Health in Turkey, 1992.

"Competitive Procurement of Generating Capacity: The Importance of Flexibility," speech before the Pacific Northwest Supply and Demand-Side Competitive Bidding Workshop, 1990; presentation at a Federal Energy Regulatory Commission Staff Seminar, 1990.

"Merger Analysis and Policy: Three Examples of Geographic Market Definition Under the DOJ Guidelines," speech before the NERA Tenth Annual Antitrust & Trade Regulation Seminar, 1989.

"Competitive Bidding in Energy Markets: A Policy Analysis," speech before the Eastern Economic Association Annual Meeting, 1989.

"Bibliometric Analysis of U.S. Pharmaceutical Industry Research Performance," speech before the Southern Economic Association Annual Meeting, 1987.

"Diversification by Nonprofit Firms: Competitive Implications," seminar presentations at the University of Hartford, University of Southern California and University of Iowa, 1987.

"Public Policy Issues Affecting the U.S. Pharmaceutical Industry," seminar presentation at Villanova University, 1987.

"Measuring the Returns to the R&D Investment," seminar presentation at the National Institutes of Health STEP Seminar, 1987.

"Protection of Intellectual Property Through Licensing: Efficiency Considerations," speech before the Eastern Economic Association Annual Meeting, 1987.

"The Protection of Intellectual Property Rights: R&D Decisions and Economic Growth," speech before the Western Economic Association Annual Meeting, 1986; and a revised version presented at the National Science Foundation--U.S. Chamber of Commerce Symposium on Protection of Intellectual Property Rights in Science, Technology, and Economic Performance: International Comparisons, 1989.

"Service Mix and Economies of Scope in the Hospital Industry," speech before the Eastern Economic Association Annual Meeting, 1986.

"On the Behavior of For Profit and Nonprofit Hospitals," speech before the Pennsylvania Economic Association Annual Meeting, 1986.

"The Cost Effectiveness of Drugs," speech before the Southeastern Pharmacy Education Conference, 1985.

"Competition as a Complement to Regulation," speech before the Eastern Economic Association Annual Meeting, 1985.

"The Role of Market Power Measures in the Search for an Antitrust Case," speech before the Midwest Economics Association Annual Meeting, 1984.

"Rate of Return Regulation and Vertical Integration Under Uncertainty," speech before the Southern Economic Association Annual Meeting, 1983.

"Advertising and Generic Trademarks," speech before the Eastern Economic Association Annual Meeting, 1980.

"Mathematics for Economists: A Two Course Sequence," speech before the Annual Meeting of the Mathematical Association of America--Maryland, District of Columbia, Virginia Section, 1979.

"The Effects of Imperfect Information on Market Equilibrium: A Survey," speech before the Southwestern Society of Economists Annual Meeting, 1979.

"The Formation of a Trader's Reservation Price," speech before the Annual Pittsburgh Modeling and Simulation Conference, 1978.

"The Effects of Uncertainty on the Firm's Demand for Money," speech before the Southwestern Economics Association Annual Meeting, 1978.

"Numerical Examples of a Market Adjustment Mechanism," speech before the Annual Pittsburgh Modeling and Simulation Conference, 1977.

"A Bidding Process for a Centralized Atomistic Market with Trading Out of Equilibrium," seminar presentations at the University of Missouri and University of Pittsburgh, 1976, and the Federal Trade Commission, 1978; speech before the Southern Economic Association Annual Meeting, 1978; and a revised version presented at a Federal Energy Regulatory Commission Staff Seminar, 1987.

"Uncertainty, Transactions Motive, and the Demand for Money," speech before the Econometric Society Meeting, 1974.

DEPOSITIONS AND TESTIMONY:

Affidavit (with H. Ware) in the matter of *U.S. vs. Western Electric Co. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 82-0192-HHG, supporting the "Reply of BellSouth Corporation in Support of its Motion for Generic Wireless Relief," filed September 2, 1994.

Affidavit on behalf of BellSouth Corporation before the Federal Communications Commission in the matter of *Amendment of the Commission's Rules to Establish New Personal Communications Services*, GEN Docket No. 90-314, filed August 30, 1994.

Affidavit (with H. Ware) in the matter of *U.S. vs. Western Electric Co. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 82-0192-HHG, supporting "BellSouth Corporation's Opposition to AT&T's Motion for a Waiver of Section I(D) of the Decree Insofar as it Bars the Proposed AT&T-McCaw Merger," filed June 28, 1994.

Affidavit, Reply Affidavit and Affidavit (with H. Ware) on behalf of BellSouth Corporation before the Federal Communications Commission in the matter of *AT&T-McCaw Merger, In re Applications of American Telephone and Telegraph Company and Craig O. McCaw For Consent to the Transfer of Control of McCaw Cellular Communications, Inc. and its Subsidiaries*, File No. ENF-93-44, filed November 1, 1993, January 18, 1994 and June 20, 1994, respectively.

Testimony on behalf of Alpha 1 Biomedicals, Inc. in the matter of *Alpha 1 Biomedicals, Inc. vs. SciClone Pharmaceuticals, Inc.*, American Arbitration Association, No. 74 E 113 00902 93, February 11-12, 1994.

Deposition on behalf of Alpha 1 Biomedicals, Inc. in the matter of *Alpha 1 Biomedicals, Inc. vs. SciClone Pharmaceuticals, Inc.*, American Arbitration Association, No. 74 E 113 00902 93, January 13, 1994.

Declaration on behalf of Alpha 1 Biomedicals, Inc. in the matter of *SciClone Pharmaceuticals, Inc. vs. Alpha 1 Biomedicals, Inc.*, U.S. District Court for the Northern District of California, Civil Action No. C93-3464-CAL, October 1, 1993.

Testimony on behalf of American Cyanamid Company in the matter of *Mylan Pharmaceuticals, Inc. vs. American Cyanamid Company vs. Roy McKnight*, U.S. District Court for the Northern District of West Virginia, Civil Action No. 90-0121-C(S), September 21-23, 1993.

Deposition on behalf of American Cyanamid Company in the matter of *Mylan Pharmaceuticals, Inc. vs. American Cyanamid Company vs. Roy McKnight*, U.S. District Court for the Northern District of West Virginia, Civil Action No. 90-0121-C(S), August 6-7, 1993.

Affidavit on behalf of American Cyanamid Company in the matter of *Mylan Pharmaceuticals, Inc. vs. American Cyanamid Company vs. Roy McKnight*, U.S. District Court for the Northern District of West Virginia, Civil Action No. 90-0121-C(S), January 20, 1993.

Testimony on behalf of Dornier Medical Systems, Inc. in the matter of *Technical Resource Services, Inc. vs. Dornier Medical Systems, Inc.*, U.S. District Court for the Middle District of Florida Orlando Division, Civil Action No. 91-762-CIV-ORL-19, June 22-23, 1993.

Deposition on behalf of Dornier Medical Systems, Inc. in the matter of *Technical Resource Services, Inc. vs. Dornier Medical Systems, Inc.*, U.S. District Court for the Middle District of Florida Orlando Division, Civil Action No. 91-762-CIV-ORL-19, January 26, 1993.

Declaration and Reply Declaration on behalf of Xoma Corporation in the matter of *Xoma Corporation vs. Centocor, Inc.*, U.S. District Court for the Northern District of California. Civil Action No. C-90-1129-RHS, January 8, 1992 and March 7, 1992, respectively.

Deposition on behalf of Xoma Corporation in the matter of *Xoma Corporation vs. Centocor, Inc.*, U.S. District Court for the Northern District of California, Civil Action No. C-90-1129-RHS; and "Certain Monoclonal Antibodies Used for Therapeutically Treating Humans Having Gram Negative Bacterial Infections," U.S. International Trade Commission. Investigation No. 337-TA-323, June 27, 1991.

Affidavit (with C. Jackson) in the matter of *U.S. vs. Western Electric Co. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 82-0192-HHG, supporting the "Request by BellSouth Corporation for a Waiver of the Modification of Final Judgment to Allow BellSouth Corporation to Provide Integrated MultiLATA Cellular Service," filed May 9, 1991.

Testimony (written) on behalf of Eighteen Vermont Utilities before the Federal Energy Regulatory Commission in the matter of *Northeast Utilities Service Company (Re: Public Service Company of New Hampshire)*, Docket Nos. EC90-10-000, ER90-143-000, ER90-144-000, ER90-145-000 and EL90-9-000, May 25, 1990.

Deposition on behalf of Ortho Pharmaceutical Corp. in the matter of *Ortho Pharmaceutical Corp. vs. Amgen, Inc.*, Endispute Arbitration, August 22 and September 15, 1989

Deposition on behalf of McGraw Edison Company in the matter of *Augustus Oliviere vs. McGraw Edison Company, et al*, U.S. District Court for the District of Columbia, Civil Action No. 87-600-JHP, November 11, 1987.

CONSULTING REPORTS:

"Answers to the DOJ Questions on the Competitive Effects of the PMA Undertaking," prepared for the Pharmaceutical Manufacturers Association, April 1993.

"Profile of the Health Care System in Canada" and "Reform of the Health Care System in Canada," (with C. Salisbury), prepared as part of the volume *The Health Care System in Canada* for the project Financing Health Care with Particular Reference to Medicines, April 1993.

"The Consequences of Pharmaceutical Product Patenting: A Critique," prepared for the Pharmaceutical Manufacturers Association, December 1992.

"Review of the GAO Report: Prescription Drugs: Companies Typically Charge More in the United States Than in Canada," prepared for a research-based pharmaceutical firm, November 1992.

"Parallel Trade in Pharmaceuticals: The Impact on Welfare and Innovation," (with R. Rapp), prepared for the Pharmaceutical Manufacturers Association, July 1992 (*NERA Working Paper No. 16*).

"The Commission Should Close Its Investigation of Lamar's Acquisition of Metro," (with J. McDavid and C. Lamar), prepared for a client involved in a FTC investigation, May 1992.

"Economics of the Research-Based Pharmaceutical Industry," (with C. Salisbury), prepared for the Pharmaceutical Manufacturers Association, February 1992.

"An Analysis of a Proposed Acquisition by R.P. Scherer International Corporation," prepared to help a client assess the competitive impact of a proposed acquisition in the U.S. and certain foreign countries, September 1991.

"Public Disclosure of Bids and Bidders," (with M. Bidwell and H. Nalbantian), prepared for New York Telephone Company, June 1991.

"Benefits and Costs of Intellectual Property Protection in Developing Countries," (with R. Rapp), prepared for a group of pharmaceutical firms interested in including intellectual property rights in the GATT, June 1990 (*NERA Working Paper No. 3*).

"Hospital Rate Regulation in Maryland: The Effect on Howard County General Hospital," (with C. Groszer and L. Nordgulen), prepared to help a client identify methodological and statistical problems with the approach to hospital rate setting in Maryland, April 1989.

"Update on Utility Competitive Bidding Programs," (with L. Nordgulen), prepared for the Energy Research Group, February 1989.

"Bidding Theory and the Baseball Player Market," prepared for a client concerned about compensation issues in professional sports, November 1988.

"The Bulk Power Coordination Services Market in Northern California: A Competitiveness Assessment," (with M. Rosenzweig and L. Nordgulen), prepared for a U.S. investor-owned utility, July 1988.

"An Analysis of the Westinghouse/ASEA-Brown Boveri Joint Ventures," prepared for a client concerned about combinations of firms in electric equipment markets, July 1988.

"Legal and Economic Theories of Contracts and Contract Discharge," prepared as background in *Wendy's vs. Pepsico* litigation, December 1987.

"A Guide to the Economics of Bidding and Auctioning Processes," prepared for the Energy Research Group, November 1987.

"Analysis of Market Power Using SAC." prepared as background in *ETSI Pipeline Project vs. Burlington Northern, Inc. et al*, U.S. District Court for the Eastern District of Texas, Civil Action No. B-84-979, October 1987.

September 1994

ATTACHMENT B

1993 CELLULAR RATES IN THE TOP 100 MSAs
REGRESSION OUTPUT
 (Dependent Variable (Y): Minimum Rate for 125 MOUs)

Constant	51.02
Standard Error of Y Estimate	9.138
R Squared	0.357
Number of Observations	200
Degrees of Freedom	186

<u>Independent Variables</u>	<u>Estimates</u>	<u>T-Statistic</u>
Income per Capita (\$)	0.001	1.89
MSA population (Millions)	1.160	3.51
Both RBOC	(3.220)	(1.56)
No RBOC	(1.390)	(0.78)
Regulation	8.625	5.18
Operator Dummies:		
Ameritech	(4.796)	(1.22)
Bell Atlantic	2.803	1.05
BellSouth	(1.534)	(0.61)
NYNEX	5.715	1.71
Southwestern	(2.081)	(0.62)
US West	9.980	3.01
Airtouch	2.040	0.79
McCaw	4.281	1.98

() negative

Note: For all variables other than Income per Capita and MSA population, the variable unit is equal to either 0 or 1.

Source: Derived from Cellular Rates, Paul Kagan and Associates, Inc., January 1994, Vol. 1, pp 47-48.

ATTACHMENT C

**WEIGHTED AVERAGE STOCK MARKET BETAS FOR
THE WIRELESS TELECOMMUNICATIONS INDUSTRY
AND THE ELECTRIC UTILITY INDUSTRY**

1994

<u>Industry</u>	<u>Average Beta Range [1] (1)</u>	<u>Weighted Average Beta Range [2] (2)</u>
Wireless Telecommunications [3]	1.11 - 1.52	1.062 - 1.700
Electric Utility [3]	0.67 - 0.84	0.689 - 0.893

[1] Sum of individual betas divided by number of firms with a reported beta.

[2] Based on percent of industry revenues or sales.

[3] Companies are included in this group based on cellular services SIC 4812 listing as of August 1994. The range is derived from betas reported in either Value Line or Bloomberg Financial Markets Commodities News.

Source: Value Line Investment Survey, Part 3: Ratings and Reports, 1994; Bloomberg Financial Commodities News, September, 1994; and Compact Disclosure Search, Primary SIC 4812, cellular service, and 4911, electric utilities.

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE WIRELESS TELECOMMUNICATIONS INDUSTRY
I/B/E/S COMPANIES**

1994

Wireless Company [1]	Beta	Total Sales (\$ Millions)	Percent of Industry Sales (Percent) (2)/\$4,687 (3)	Weighted Beta (1)×(3) (4)
	(1)	(2)	(3)	(4)
Associated Communications Group Inc.	1.38	\$ 107	2.28 %	0.032
Cellular Communication Inc.	0.31	53	1.13	0.004
Cellular Comm. of Puerto Rico Inc.	1.12	43	0.92	0.010
Cellular Inc.	-	na	-	-
Centennial Cellular Corp.	1.58	56	1.19	0.019
Contel Cellular Corp.	1.28	461	9.84	0.126
LIN Broadcasting Corp.	0.73	777	16.58	0.121
McCaw Cellular Communications Inc.	1.13	2,488	53.08	0.600
Nationwide Cellular Service Inc.	1.13	195	4.16	0.047
Nextel Communications Inc.	1.97	77	1.64	0.032
Pittencrieff Communications Inc.	na	-	-	-
US Cellular Corp.	0.82	288	6.14	0.050
Vanguard Cellular Systems Inc.	0.72	142	3.03	0.022
Total	12.17	\$ 4,687	100.00 %	1.062
Average [2]	1.11			

na not available
- not applicable

Note: Numbers may not add due to rounding.

[1] Companies are included in this list based on Institutional Brokers Estimate System (I/B/E/S) listing as of November 18, 1993, of companies whose primary line of business is in the cellular industry.

[2] Total divided by number of firms with a reported beta (25).

Source: Compustat via FactSet Data System, Inc. and Compustat Disclosure: Institutional Brokers Estimate System (I/B/E/S) listing, November 18, 1993 and Bloomberg Financial Markets Commodities News, September 1994

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE WIRELESS TELECOMMUNICATIONS INDUSTRY
BLOOMBERG DATA**

1994

Wireless Company [1]	Beta	Total Sales (\$ Millions)	Percent of Industry Sales (Percent) (2)/\$5,488 (3)	Weighted Beta (1)×(3) (4)
	(1)	(2)	(3)	(4)
A+ Communications Inc.	na	\$ -	- %	-
AirTouch Communications	na	-	-	-
American Mobile Satellite Corp.	na	-	-	-
American Mobile Systems Inc.	1.85	8	0.15	0.003
American Paging Inc.	na	-	-	-
Arch Communications Group Inc.	0.94	61	1.11	0.010
Associated Communications Corp.	1.38	107	1.95	0.027
ATC Inc.	na	-	-	-
Beeper Plus Inc.	na	-	-	-
C TEC Corp.	na	-	-	-
CELLCOM Corp.	na	-	-	-
Cellular Communication of Puerto Rico	1.12	43	0.78	0.009
Cellular Communications Inc.	0.31	53	0.97	0.003
Cellular Communications Int'l.	-	na	-	-
Cellular Inc.	na	-	-	-
Cellular Telephone Enterprises	0.80	4	0.07	0.001
Celutel Inc.	na	-	-	-
CENCALL Communications Corp.	na	-	-	-
Centennial Cellular Corp.	1.58	56	1.02	0.016
Cleamet Communications Inc.	na	-	-	-
COMCAST Cellular Corp.	na	-	-	-
Commnet Cellular	1.29	53	0.97	0.012
Contel Cellular Inc.	1.28	461	8.40	0.108
Continental Communications Corp.	na	-	-	-
CruisePhone Inc.	na	-	-	-
Dial Call Communications Inc.	na	-	-	-
Dial Page Inc.	1.77	72	1.31	0.023
Dominion Resources Inc.	na	-	-	-
Fleet Call Inc.	na	-	-	-
General Cellular Corp.	na	-	-	-
InfoPage Inc.	na	-	-	-
International CableTel	1.73	11	0.20	0.003
InterCel Inc.	na	-	-	-
IUSACELL Group	na	-	-	-
LIN Broadcasting	0.73	777	14.16	0.103
LUXCEL Group Inc.	0.53	3	0.05	0.000
McCaw Cellular 'A'	1.13	2,488	45.34	0.512
MetroCall Inc.	na	-	-	-
MilliCom Inc.	na	-	-	-
MilliCom International Cellular	na	-	-	-
Mobile Telecommunication Tech.	1.01	141	2.57	0.026
MobileMedia Communications Inc.	na	-	-	-
MobileMedia Corp.	na	-	-	-
Nationwide Cellular Service	1.13	195	3.55	0.040

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE WIRELESS TELECOMMUNICATIONS INDUSTRY
BLOOMBERG DATA**

1994

<u>Wireless Company [1]</u>	<u>Beta</u>	<u>Total Sales (\$ Millions)</u>	<u>Percent of Industry Sales (Percent) (2)/\$5,488 (3)</u>	<u>Weighted Beta (1)×(3) (4)</u>
	(1)	(2)	(3)	(4)
Nextel Communications, Inc. 'A'	1.97	\$ 77	1.40 %	0.028
OneComm Corp.	na	-	-	-
PACTEL Corp.	na	-	-	-
Page America Group Inc.	na	-	-	-
PageMart Inc.	na	-	-	-
Paging Network Inc.	1.50	406	7.40	0.111
Palmer Wireless Inc.	na	-	-	-
Pittencrieff Communications Inc.	na	-	-	-
PNF Industries Inc.	na	-	-	-
Premiere Page Inc.	na	-	-	-
PRONET Inc.	1.07	26	0.47	0.005
Racal Telecommunications - ADR	na	-	-	-
Telephone Company of Chile	na	-	-	-
United States Cellular Corp.	0.82	288	5.25	0.043
United States Paging Corp.	0.48	16	0.29	0.001
USA Mobile Communications Hold.	na	-	-	-
USA Mobile Communications Inc.	na	-	-	-
Vangaurd Cellular Systems Inc.	0.72	142	2.59	0.019
Total	25.14	\$ 5,488	100.00 %	1.104
Average [2]	1.14			

na not available

- not applicable

Note: Numbers may not add due to rounding.

[1] Includes U.S. companies which report their primary SIC code as 4812, cellular service.

[2] Total divided by number of firms with a reported beta (22).

Source: Bloomberg Financial Markets Commodities News, September 1994 and
Compact Disclosure Search, Primary SIC 4812, cellular service.

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE WIRELESS TELECOMMUNICATIONS INDUSTRY
VALUE LINE DATA**

1994

Wireless Company [1]	Beta	Total Revenue [2] (\$ Millions)	Percent of Industry Revenue (Percent) (2)/\$3,635 (3)	Weighted Beta (1)×(3) (4)
	(1)	(2)	(3)	(4)
Contel Cellular	1.65	\$ 374	10.29 %	0.17
LIN Broadcasting	1.40	689	18.95	0.27
McCaw Cellular	1.85	2,195	60.38	1.12
Mobile Telecommunications Tech.	1.25	130	3.58	0.04
Nextel Communications, Inc.	na	-	-	-
U.S. Cellular Corp.	1.45	247	6.80	0.10
Total	7.6	\$ 3,635	100.00 %	1.70
Average [3]	1.52			

na not available

- not applicable

Note: Numbers may not add due to rounding.

[1] Companies are included in this group based on Institutional Brokers Estimate System (I/B/E/S) listing as of November 18, 1993, of companies whose primary line of business is in the cellular industry and on their inclusion in The Value Line record and reports.

[2] Revenues for 1993 on total company basis.

[3] Total divided by number of firms with a reported beta (5).

Source: The Value Line Investment Survey, Part 3: Ratings and Reports, Edition 5, July 15, 1994, pp. 745-774 and Institutional Brokers Estimate System (I/B/E/S) listing, as of November 18, 1993.

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
BLOOMBERG DATA**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Sales (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$109,570 (3)</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
AEP Generating	na	\$ -	- %	-
Alabama Power	na	-	-	-
Allegheny Gener.	na	-	-	-
Allegheny Power	0.88	2,438	2.23	0.020
American Electric Power	0.99	5,574	5.09	0.050
Appalachian Power	na	-	-	-
Arizona Public Service	na	-	-	-
Arkansas Power & Electric	na	-	-	-
Atlantic City Electric	na	-	-	-
Atlantic Energy	0.86	907	0.83	0.007
Bangor Hydro-Electric	0.82	174	0.16	0.001
Black Hills Corp.	0.94	142	0.13	0.001
Blackstone Val	na	-	-	-
Boston Edison Co.	0.97	1,528	1.39	0.014
Cambridge Electric & Light	na	-	-	-
Canal Electric	na	-	-	-
Carolina P & L	1.17	2,945	2.69	0.031
Centerior Energy	0.60	2,470	2.25	0.014
Central LA Electric	0.94	391	0.36	0.003
Central Maine Power	0.81	912	0.83	0.007
Central Power &	na	-	-	-
Central Vermont Public Service	0.67	279	0.25	0.002
Central & South West	1.04	3,769	3.44	0.036
Cleveland Electric	na	-	-	-
Columbus Sth. Power	na	-	-	-
Commonwealth Edison	-	na	-	-
Commonwealth Electric Co.	na	-	-	-
Connecticut Light & Power	na	-	-	-
Detroit Edison	1.00	3,617	3.30	0.033
Dominion Resources Inc./VA	0.88	4,600	4.20	0.037
DQE Inc.	0.93	1,253	1.14	0.011
Duke Power Co.	0.93	4,374	3.99	0.037
Eastern Utilities	0.77	585	0.53	0.004
Eastern Edison	na	-	-	-
El Paso Electric	0.94	551	0.50	0.005
Empire District	0.55	171	0.16	0.001
Enersis SA - ADR	na	-	-	-
Entergy Corp.	0.97	5,481	5.00	0.049

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
BLOOMBERG DATA**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Sales (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$109,570 (3)</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
Eselco Inc.	na	\$ -	- %	-
Florida Power Company	na	-	-	-
Florida Progress	0.91	2,713	2.48	0.023
Gen. Public Utility	0.89	3,662	3.34	0.030
Georgia Power Company	na	-	-	-
Granite State Electric	na	-	-	-
Green Mountain Power	0.63	147	0.13	0.001
Gulf Power	na	-	-	-
Hawaiian Electric	0.81	1,131	1.03	0.008
Hawaiian Electric Company	na	-	-	-
Houston Industry Inc.	0.79	4,212	3.84	0.030
Houston Lighting	na	-	-	-
Hydro Quebec	na	-	-	-
Idaho Power	0.94	527	0.48	0.005
Indiana Michigan Power	na	-	-	-
Indianapolis Power	na	-	-	-
IPALCO Enterprise Industries	0.92	684	0.62	0.006
IX - Electric Power	na	-	-	-
Jersey Central P&L	na	-	-	-
Kansas City P&L	1.03	880	0.80	0.008
Kentucky Power	na	-	-	-
Kingsport Power	na	-	-	-
KU Energy Corp.	0.93	633	0.58	0.005
Louis Power & Light	na	-	-	-
Maine Public Service	0.54	60	0.05	0.000
Maine Yankee	na	-	-	-
Mass Electric Co.	na	-	-	-
Metro Edison	na	-	-	-
Mississippi Power	na	-	-	-
Mississippi Power & Light	na	-	-	-
Monongahela Power	na	-	-	-
Narragansett Electric	na	-	-	-
Nevada Power Company	0.83	717	0.65	0.005
New Engalnd Power	na	-	-	-
New England Electric	0.95	2,230	2.04	0.019
Northeast Utilities	0.93	3,638	3.32	0.031
Ohio Edison Company	0.98	2,397	2.19	0.021
Ohio Power	na	-	-	-

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
BLOOMBERG DATA**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Sales (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$109,570 (3)</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
Oklahoma G&E	0.88	\$ 1,433	1.31 %	0.012
Otter Tail Power	0.61	277	0.25	0.002
PECO Energy Co.	0.85	4,095	3.74	0.032
Pennsylvania Electric Company	na	-	-	-
Pennsylvania Power Co.	na	-	-	-
Pennsylvania Power & Light	0.86	2,789	2.55	0.022
Pinnacle West	1.05	1,737	1.59	0.017
Portland General	1.14	957	0.87	0.010
Portland General Electric	na	-	-	-
Potomac Edison	na	-	-	-
Potomac Electric Power	1.00	1,827	1.67	0.017
Potomac Electric Power [3]	-	-	-	-
PSI Resources	0.91	1,160	1.06	0.010
Public Service Indiana	na	-	-	-
Public Service of Oklahoma	na	-	-	-
Puget Sound Power/LT	0.92	1,144	1.04	0.010
Safe Harbor Water	na	-	-	-
Savannah Electric &	na	-	-	-
SCECorp.	0.91	7,856	7.17	0.065
SCECorp. [3]	-	-	-	-
Southern California Edison	na	-	-	-
Southern Company	0.80	8,582	7.83	0.063
Southwestern El. P.	na	-	-	-
Southwestern Public	0.65	833	0.76	0.005
System Energy Resources	na	-	-	-
Tampa Electric	na	-	-	-
TECO Energy Inc.	0.88	1,347	1.23	0.011
Tennessee Valley Authority	na	-	-	-
Texas Utility	0.75	5,768	5.26	0.039
Texas-New Mexico	na	-	-	-
TNP Enterprises	0.44	479	0.44	0.002
Toledo Edison Co.	na	-	-	-
Tuscon Electric Power	0.25	697	0.64	0.002
Union Electric Company	0.91	2,073	1.89	0.017
United Illumination	0.79	661	0.60	0.005
Upper Peninsula	0.42	63	0.06	0.000
Vermont Yankee	na	-	-	-
Virginia Electric and Power	na	-	-	-

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
BLOOMBERG DATA**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Sales (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$109,570 (3)</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
West Pennsylvania Power	na	\$ -	- %	-
West Texas Utilities	na	-	-	-
Western Mass Electric	na	-	-	-
Wheeling Power	na	-	-	-
Wisconsin Electric Power	na	-	-	-
Total	44.76	\$ 109,570	100.00 %	0.893
Average [2]	0.84			

na not available

- not applicable

Note: Numbers may not add due to rounding.

[1] U.S. companies as reported under SIC 4911, electric utilities.

[2] Total divided by number of firms with available beta, 53.

Source: Bloomberg Financial Markets Commodities News, under SIC code 4911, electric utilities, September 1994.

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
VALUE LINE COMPANIES**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Revenue (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$189053.2</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
Allegheny Power System	0.65	\$ 2,331.5	1.23 %	0.008
American Electric Power	0.75	5,268.8	2.79	0.021
Atlantic Energy, Inc.	0.65	865.7	0.46	0.003
Baltimore Gas & Electric	0.75	2,668.7	1.41	0.011
Boston Edison	0.75	1,482.2	0.78	0.006
Carolina Power & Light	0.75	2,895.4	1.53	0.011
Centerior Energy Corp	0.60	2,474.0	1.31	0.008
Central Hudson Gas & Electric	0.70	517.4	0.27	0.002
Central Louisiana Electric	0.55	382.4	0.20	0.001
Central Maine Power	0.65	893.6	0.47	0.003
Central Vermont Public Service	0.70	279.4	0.15	0.001
Central & South West	0.70	3,687.0	1.95	0.014
CILCORP Inc.	0.60	584.5	0.31	0.002
Cincinnati Gas & Electric	0.70	1,751.7	0.93	0.006
CIPSCO Inc.	0.65	844.8	0.45	0.003
CMS Energy Corp.	0.90	3,482.0	1.84	0.017
Commonwealth Edison	0.75	5,260.4	2.78	0.021
Commonwealth Energy System	0.65	940.7	0.50	0.003
Consolidated Edison	0.75	6,265.4	3.31	0.025
Delmarva Power & Light	0.65	970.6	0.51	0.003
Detroit Edison	0.70	3,555.2	1.88	0.013
Dominion Resources, Inc.	0.65	4,433.9	2.35	0.015
DPL Inc.	0.55	1,151.3	0.61	0.003
DQE	0.70	1,195.6	0.63	0.004
Duke Power	0.65	4,281.9	2.26	0.015
Eastern Utilities Associates	0.65	566.5	0.30	0.002
El Paso Electric Co.	-	na	-	-
Empire District Electric	0.50	168.4	0.09	0.000
Entergy Corp.	0.70	4,485.3	2.37	0.017
Florida Progress Corp.	0.65	2,449.0	1.30	0.008
FPL Group, Inc.	0.65	5,316.3	2.81	0.018
General Public Utilities	0.70	3,596.1	1.90	0.013
Green Mountain Power	0.55	147.3	0.08	0.000
Hawaiian Electric	0.70	1,142.2	0.60	0.004
Houston Industries	0.65	4,323.9	2.29	0.015
Idaho Power	0.65	540.4	0.29	0.002
IES Industries Inc.	0.60	801.3	0.42	0.003
Illinova Corp.	0.75	1,581.2	0.84	0.006

**WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
VALUE LINE COMPANIES**

1994

<u>Electric Utility Company [1]</u>	<u>Beta</u>	<u>Total Revenue (\$ Millions)</u>	<u>Percent of Industry Revenue (Percent) (2)÷\$189053.2 (3)</u>	<u>Weighted Beta (1) × (3) (4)</u>
	(1)	(2)	(3)	(4)
Interstate Power	0.55	\$ 309.5	0.16 %	0.001
Iowa-Illinois Gas & Electric	0.60	545.4	0.29	0.002
IPALCO Enterprises Inc.	0.65	664.3	0.35	0.002
Kansas City Power & Light	0.65	857.5	0.45	0.003
KU Energy Corp.	0.70	606.6	0.32	0.002
LG&E Energy Corp.	0.60	900.0	0.48	0.003
Long Island Lighting	0.80	2,881.0	1.52	0.012
MDU Resources Group, Inc.	0.50	439.6 [2]	0.23	0.001
Midwest Resources	0.50	1,168.1	0.62	0.003
Minnesota Power & Light	0.65	505.5	0.27	0.002
Montana Power	0.75	1,075.6	0.57	0.004
Nevada Power	0.70	651.8	0.34	0.002
New England Electric System	0.70	2,234.0	1.18	0.008
New York State Electric & Gas	0.75	1,800.1	0.95	0.007
Niagra Mohawk Power	0.75	3,933.4	2.08	0.016
NIPSCO Industries	0.75	1,677.9	0.89	0.007
Northeast Utilities	0.65	3,629.1	1.92	0.012
Northern States Power Company	0.75	2,404.0	1.27	0.010
Northwestern Public Service	0.55	153.3	0.08	0.000
Ohio Edison	0.85	2,369.9	1.25	0.011
Oklahoma Gas & Electric	0.65	1,447.3	0.77	0.005
Orange & Rockland Utilities	0.55	971.4	0.51	0.003
Otter Tail Power	0.55	265.2	0.14	0.001
Pacific Gas & Electric	0.70	10,582.0	5.60	0.039
PacifiCorp	0.70	3,412.4	1.80	0.013
PECO Energy	0.70	3,987.5	2.11	0.015
Pennsylvania Power & Light	0.60	2,727.0	1.44	0.009
Pinnacle West Capital	0.95	1,718.5	0.91	0.009
Portland General	0.70	946.8	0.50	0.004
Potomac Electric Power	0.70	1,725.2	0.91	0.006
PSI Resources Inc.	0.75	1,088.4	0.58	0.004
Public Service Enterprise Group	0.70	5,705.6	3.02	0.021
Public Service of Colorado	0.70	1,998.7	1.06	0.007
Public Service Company of New Mexico	0.85	873.9	0.46	0.004
Puget Sound Power & Light	0.65	1,112.9	0.59	0.004
Rochester Gas & Electric	0.65	949.0	0.50	0.003
San Diego Gas & Electric	0.60	1,980.1	1.05	0.006
SCANA Corp.	0.65	1,264.2	0.67	0.004

WEIGHTED AVERAGE STOCK MARKET BETA
FOR THE ELECTRIC UTILITY INDUSTRY
VALUE LINE COMPANIES

1994

Electric Utility Company [1]	Beta	Total Revenue (\$ Millions)	Percent of Industry Revenue (Percent) (2)÷\$189053.2 (3)	Weighted Beta (1) × (3) (4)
	(1)	(2)	(3)	(4)
SCEcorp	0.65	\$ 7,821.0	4.14 %	0.027
Sierra Pacific Res.	0.60	528.1	0.28	0.002
Southern Company	0.65	8,489.0	4.49	0.029
Southern Indiana Gas & Electric	0.60	328.5	0.17	0.001
Southwestern Public Service	0.65	809.8	0.43	0.003
St. Joseph Light & Power	0.50	88.5	0.05	0.000
TECO Energy, Inc.	0.65	1,283.9	0.68	0.004
Texas Utilities	0.60	5,434.5	2.87	0.017
TNP Enterprises, Inc.	0.55	474.2	0.25	0.001
Tucson Electric Power	0.65	622.4	0.33	0.002
Union Electric	0.65	2,066.0	1.09	0.007
United Illuminating	0.60	653.0	0.35	0.002
UtiliCorp United Inc.	0.65	1,571.6	0.83	0.005
Washington Water Power	0.55	640.6	0.34	0.002
Western Resources, Inc.	na	-	-	-
Wisconsin Energy	0.70	1,643.7	0.87	0.006
Wisconsin Public Service	0.65	680.6	0.36	0.002
WPL Holdings, Inc.	0.70	773.1	0.41	0.003
Total	61.20	\$ 189,053.2	100.00 %	0.689
Average [3]	0.67			

na not available

- not applicable

[1] Includes all electric utilities as listed in The Value Line Investment Survey.

[2] Before cumulative effect of accounting change.

[3] Total divided by number of firms with available beta, 92.

Source: The Value Line Investment Survey, Part 3: Ratings and Reports: Edition 1, June 17, 1994, pp. 159-194; Edition 5, July 15, 1994, pp. 145-774 and Edition 11, August 26, 1994,

ATTACHMENT D